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Success and failure in obtaining financing through Portuguese crowdfunding: the case of PPL

by

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Supervised by

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To my dear parents

Biographical Note

Luís Pedro Cunha de Oliveira was born on July 31, 1991, in Porto, Portugal. At six years old he moved to the northern Valença, district of Viana do Castelo, where he lived until reaching his adulthood. At that time, in the year of 2009, he started his undergraduate studies at School of Economics and Management, University of Porto.

During the undergraduate studies, Luís Pedro integrated non-profit organizations exclusively composed by students, particularly AIESEC and AEFEP, where he developed technical and social skills.

Luís Pedro concluded his undergraduate course with a final grade of 13/20 in July, 2013, and until August 30 he experienced a summer internship in Caixa Geral de Depósitos (C.G.D.), being exposed to the activities performed by the biggest Portuguese retail bank at the time.

In September of 2013, he started his Master course in Finance at the same School, with the intent to study the areas of corporate finance and financial markets. He also integrated FEP Finance Club, the finance and investment club of University of Porto, and one year after he assumed a position as the director of the department of Corporate Finance. Meanwhile, he did a 3-month internship in assurance at Ernst&Young. In September of 2015, he started working for Deloitte as analyst in the department of Financial Advisory Services.

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I personally believe people that are close to me have a huge impact on the way that I act, think and feel, as they have frequent manifests of esteem, pride and love towards me. In this already long journey they have significantly contributed to my confidence and welfare, either with their emotions either with their reasoning, giving me hope of a bright future.

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Finally, I thank my family, in particular my mother Maria do Carmo and my brother Luís, for actively supporting all my decisions and encourage me to follow my dreams. You are and will permanently be a part of me.

Resumo

O *Crowdfunding* é um mercado bilateral onde promotores e financiadores se podem encontrar para atingir os seus objetivos, nomeadamente obter financiamento e recompensas (in)tangíveis, respetivamente. Emergiu como uma alternativa aos tradicionais meios de financiamento (empréstimos bancários, *venture capital* e *angel finance*) e está diretamente ligado ao empreendedorismo e inovação. Sendo um mercado de rápido crescimento, parece ter extrema importância estudar os desenvolvimentos recentes do *Crowdfunding* como forma de financiamento de projetos e empresas em fase embrionária, ainda mais em contexto de pronunciadas restrições financeiras. O fenómeno é cada vez mais estudado por académicos e investigadores, que assumem diferentes perspetivas nas suas análises. Recorremos, na presente Dissertação, aos modelos *logit* e *probit* para determinar e estudar os fatores que levam a um financiamento bem-sucedido em Portugal, tendo por base projetos promovidos na mais antiga, maior e mais reconhecida plataforma de *crowdfunding* portuguesa – PPL – Crowdfunding Portugal. Descobrimos que o montante pretendido pelo promotor tem provavelmente uma correlação negativa com o sucesso, enquanto o número de níveis de recompensa, a origem do projeto (em particular, se o projeto for de Lisboa) e a experiência do empreendedor parecem ter um impacto positivo na obtenção de financiamento. Adicionalmente, o género do empreendedor parece não ter efeito no sucesso ou insucesso na obtenção de financiamento. As conclusões deste estudo poderão ser úteis tanto para que os empreendedores compreendam os fatores que poderão ser determinantes na concretização dos seus objetivos de captação de fundos, como para que os investidores tenham perceção acerca das melhores oportunidades de investimento através do *crowdfunding* em Portugal.

Abstract

Crowdfunding is a two-sided market where fundraisers and funders can meet in order to accomplish their main goals, getting funding and being (in)tangibly rewarded, respectively. It has emerged as an alternative to traditional forms of financing (bank loans, venture capital or angel finance) and is straightly connected with entrepreneurship and innovation. As a fast growing market, it seems to be of extreme importance to study the recent developments of *Crowdfunding* as a way for early-stage businesses or projects to get financing, even more in a context in which they face pronounced financial restrains. Being more and more a phenomenon analysed by academics, we recur to logit and probit models to determine and study the factors that lead to successful fundraising in Portugal, using projects promoted in the oldest, largest and most well-known Portuguese *crowdfunding* platform – PPL – Crowdfunding Portugal. We find that the target amount is likely to have a negative correlation with success, while the number of levels of reward, the origin of the project (in particular, being from Lisbon) and entrepreneur's experience have a likely positive impact for a successful fundraising. Additionally, it seems that entrepreneur gender does not influence the outcome of the fundraising. The findings of this study might be useful both for entrepreneurs to understand the factors that may be decisive in meeting their fundraising goals, as so investors have perception about the best investment opportunities in Portuguese *crowdfunding*.

Keywords: *Crowdfunding*; Finance; Fundraising; Start-ups; Entrepreneurship.

JEL-Codes: G21; G23; G24; G32.

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List of abbreviations and acronyms

AF	Angel Finance
CAPS	*Crowdfunding* Accreditation for Platform Standards
CMVM	Portuguese Securities Market Commission
DN	Duration of a *crowdfunding* campaign, in days
HPT	Ratio between highest pledging level and target
IMG	Number of images uploaded by an entrepreneur during a campaign
JOBS Act	Jumpstart Our Business Startups Act
LPM	Linear probability model
ML	Maximum likelihood estimator
NPL	Number of pledging levels
OLS	Ordinary least squares
PPL	PPL – Crowdfunding Portugal
SEC	U.S. Securities and Exchange Commission
TG	Target amount defined by the entrepreneur
UK	United Kingdom
USA	United States of America
VC	Venture capital

1. Introduction

Crowdfunding is a tool that is emerging as an alternative to traditional ways of financing for entrepreneurs, such as business angels, venture capital investment or bank loans. The main goal is to help fundraisers obtaining the funds they need to launch their ideas, while allowing individuals to finance those ideas, in a very simple and direct way. It occurs when a large group of people, called the "crowd", agrees to collaborate with relatively small amounts of money to a project, in exchange for a tangible or intangible reward (Moutinho and Leite, 2013).

This new form of capital formation emerged in an organized way in the arouse of the 2008 financial crisis largely because of the difficulties faced by entrepreneurs and early-stage enterprises in raising funds (World Bank, 2013). Banks were less willing to lend money, angel investment returns were steadily and venture capital was not being able to fill all the entrepreneurs funding needs.

Entrepreneurs started looking for capital through other ways of financing, and in less than a decade *crowdfunding* has a very significant presence in a number of developed economies, as Australia, the United Kingdom, the Netherlands, Italy and the United States, among others. It is also spreading across the developing world and many people consider it as an efficient instrument with a lot of potential for the financing of underdeveloped regions (World Bank, 2013). Using social networks, social profiles and the viral nature of web-based communication, individuals and companies have already raised billions of dollars through *crowdfunding*, either in form of debt or equity, either in form of donations.

Among the several types of *crowdfunding* platforms (CFP), reward-based seems to be until now the model used by most of the CFP and the one that has captured more funding from the crowd. *Kickstarter* is the major CFP in the world using that model, being present in the United States (USA) and United Kingdom (UK), and counts a total funding of more than $1.85 billion to date. In Portugal, PPL – Crowdfunding Portugal (PPL) is the market leader, with a total funding of more than €1.12 million.

Despite being a very recent phenomenon, there is already a very significant number of studies regarding *crowdfunding*, as the number of publications on the topic has been growing on a fast pace. We propose to study both the factors that result in success and also in failure in the Portuguese market, with the intention of distinguishing the intrinsic characteristics that may have a strong influence on a successful fundraising.

In order to achieve the objective, we will retrieve information on successful and unsuccessful projects from PPL and compile the information. Using regression models, we will see which ex-ante project and entrepreneurial factors are significantly more relevant for raising investors' funds.

This dissertation is structured as follows. In Chapter 2, a Literature Review is conducted, including topics as entrepreneurship financing, definitions for *Crowdfunding* and its importance as a financial market, the actors and their role, types of CFP, relation with financial literature and also the most relevant studies for the present Dissertation. In Chapter 3 we present the data construction and sample characteristics. Methodological aspects regarding our empirical analysis, including the models used and summary statistics, are described in Chapter 4. In Chapter 5, we assess and discuss the results obtained. Finally, concluding remarks are expressed in Chapter 6.

2. Literature Review

The purpose in this chapter is to present the concepts and the dimensions of *Crowdfunding* proposed by Literature. Additionally, it is important to present the state-of-art regarding the variables which seem to be decisive to a perfect match between the ones that need funding (now on, called *fundraisers*, *founders*, *entrepreneurs* or *promoters*) and the ones willing to commit their funds (now on, called *investors*, *crowd*, *funders* or *backers*).

As many researchers note, the literature regarding this way of financing is relatively small but is significantly increasing (Mollick, 2014). The first time the concept being addressed was in Michael Sullivan's blog, named *fundavlog*[1], in 2006, but is has evolved to a much broader and complex way for entrepreneurs to obtain financing, as well as an investment opportunity for investors.

2.1. Entrepreneurship financing

Entrepreneurship started gaining importance in the early 20th century, with an increasing number of studies being published on the theme. Schumpeter is an unavoidable author in this field, being the first treating the entrepreneur as endogenous to the innovation process, in *The Theory of Economic Development* (Schumpeter, 1934). The author defined "entrepreneur" as "the individual whose function is to carry them [enterprises] out" (1934, p. 74), assigning him the "fundamental role of innovating through the introduction of new products, markets or methods of production" (Rocha, 2014, p. 8).

Entrepreneurs have different tasks along the business development stages, as illustrated in Figure 1. For each stage entrepreneurs have to define and choose from a wide variety of financing schemes the best way to finance their ideas, as it is a matter of great importance for the outcome of the entrepreneurial efforts.

[1] *Fundavlog* does not exist nowadays.

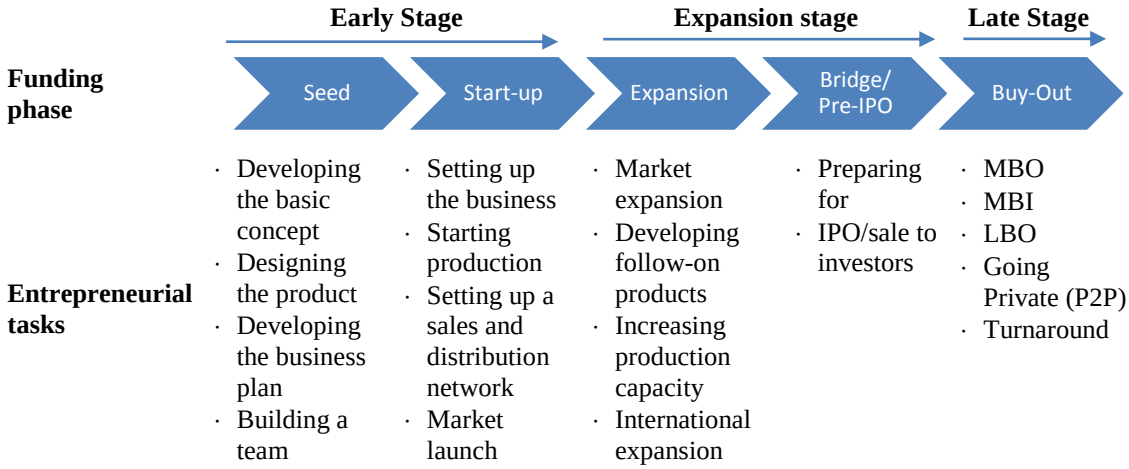

Figure 1 - Business development stages. Taken from Schalast (2012).

Companies can finance their projects using internal funds, the ones obtained through the activity of the company, or external funds, as debt or equity financing, where those who provide funds remain external parties. Table 1 describes several equity and debt financing schemes available to entrepreneurs and companies.

Table 1 – Adapted from Schwienbacher and Larralde (2010)

	Investor	Description
Equity	Entrepreneur and team members	The entrepreneur invests his own money in the company, or money obtained through a personal loan.
	Friends and family	Entrepreneurs' friends and family.
	Business Angels	Wealthy individuals willing to invest in small projects
	Venture Capitalists	Specialized investors gathering money from non-specialists and placing it into bigger projects for period of 5-7 years
	Other companies/ Strategic Investors	Other companies can decide to invest in projects they believe have strategic importance to them
	Stock markets	Members of the public invest in the company through a public offering
Debt	Banks	Loans
	Leasing companies	Provide equipment and office space to entrepreneurs against lease payments
	Government agencies	Subsidy for particular projects
	Customers/suppliers	e.g., trade credit
	Bootstrapping	Use of trade credit, credit card and other methods, including working capital management

The *pecking order theory* introduced by Myers and Maljuf (1984) states that entrepreneurs shall use internal funds first, in a perfect information world, then debt (provides tax benefits) and only then equity financing. However, as there are information asymmetries inherent to the market of start-ups, the choice regarding the business capital structure is of great importance to entrepreneurs (Voorbraak, 2011).

In the very beginning of the business life cycle, entrepreneurs traditionally indeed use their own money or ask to family and friends. But that source is never enough to finance all the activities as the business grows and thus entrepreneurs end up looking for external sources of financing. Entrepreneurs face several issues in attracting outside capital given their high risk and uncertainty. Start-ups do not have any history yet, their cash flows are not stable and they do not have enough assets to serve as collateral (Schwienbacher and Larralde, 2010).

The traditional equity financing methods, in which companies exchange money by shares of the business, for businesses in the early stage of their life cycle, are venture capital (VC) and angel finance (AF), while bank loans are the most common debt way of financing (Voorbraak, 2011). It seems important to explore these ways of financing as a starting point for the comprehension and analysis of the *crowdfunding* phenomena.

Bank loans are the most traditional way of financing used by entrepreneurs and small enterprises (Voorbraak, 2011). These institutions require collateral and guarantees, in order to reduce their risk and concede affordable interest rates, but as previously referred start-ups usually do not have assets valuable enough. Additionally, banking institutions use credit risk models for analysing the concession of credit and may require historic information about a company business and financials, being even harder for start-ups to prove capacity of paying debt back in the future. Due to the financial crisis that started in 2008, banks constrained their credit offerings and became even more demanding regarding the client risks, what naturally had a negative impact for young projects and small entrepreneurs in obtaining financing through this way.

Angel finance is also a form of equity finance and is described as the first round of external independent investment (McKaskill, 2009), when personal, family and friends' funds have been exhausted and are no longer available to the entrepreneur (Cumming and

Johan, 2014). Business angels are investors that use their own capital to invest in high-risk and high-return entrepreneurial ventures, without an intermediate (Voorbraak, 2011). They are classified as investors sufficiently knowledgeable to understand the risks involved with investing in an unquoted company, having a history of investing in a range of financial instruments ("EBAN Glossary," 2013).

Access to AF has been decreasing since the financial crisis of 2008, facing steadily rates since their roughly 10-year peak in 2008 according to a study by PwC MoneyTree (Tomczak and Brem, 2013). Additionally, only a very small percentage of entrepreneurs seeking funding from angel investors actually get the amounts they want, and Collins and Pierrakis (2012) suggest many angels only consider investing in businesses looking to raise larger amounts of funding (Tomczak and Brem, 2013).

Venture capital is other equity financing method and has five main characteristics that distinguish it from any other source of financing (Metrick and Yasuda, 2010). First, it is a financial intermediary that uses investors' capital and invests it in a portfolio of companies. Second, this portfolio only includes private companies. Third, the venture capital firm actively monitors and helps the companies held. Fourth, its primary goal is the maximization of the financial return by exiting investments, usually through a sale or an initial public offering. Finally, the VC investment is used to finance the internal growth of the companies in the portfolio.

Despite being one of the most commonly used equity financing method, Lavinsky[2] says the vast majority of entrepreneurs fails in raising VC since most of them cannot scale fast enough nor do have the potential for a large enough exit, and also because the number of venture capitalists is too small if compared to the number of entrepreneurs who need money. This idea is sustained by other authors, as Voorbraak (2011) and Pagliery (2012), with these two presenting evidence that entrepreneurs have difficulty in obtaining funding for amounts less than €150.000 and $100.000 respectively. Additionally, ventures in

[2] David Lavinsky (Aug. 27, 2010), Funding fathers, SMART BUSINESS, http://www.sbnonline.com/article/funding-fathers-the-birth-of-business-crowdfunding-is-providing-new-ways-to-get-money/

early-stages are not appealing enough to outside investors to attract venture capital funding, being in between a stage of potential failure or success (Tomczak and Brem, 2013).

The main differences between angel finance and venture capital is that angels have a lower cost of capital and tend to invest on companies in an early-stage phase of their business cycle than VC investments, making a larger number of smaller investments (Metrick and Yasuda, 2010). Angels invest from $25,000 to $100,000 per year, on average, corresponding to five times the investment of the venture capital sector (McKaskill, 2009).

2.2. *Crowdfunding* definition and importance

In order to fully understand the role of *crowdfunding*, we shall begin by presenting its origins. The term derives from *Crowdsourcing*, which was first introduced by Jeff Howe in 2006[3] and is defined as the "act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call" (Crowdsourcing.org, 2014). Kleeman and Gunther (2008) also explain that *Crowdsourcing* takes place when a profit oriented firm recurs to the internet to outsource specific tasks for the making or sale of any of its products to the general public, the crowd. It may concern design and selection, problem solving, journalism, marketing, funding and so on. If we consider the outsourcing of the task of financing, we enter a more specific concept and of greater importance to the present study – *crowdfunding* – which is going to be hereinafter scrutinized.

Crowdfunding is a very recent form of capital formation that emerged in an organized way during the 2008 financial crisis, mainly due to the difficulties for entrepreneurs and early-stage enterprises in raising funds through the conventional ways, as bank loans. The Oxford University (2014) defines *crowdfunding* as the "practice of funding a project or venture by raising many small amounts of money from a large number of people, typically

[3] Jeff Howe (June 2006), The Rise of Crowdsourcing, WIRED.
http://archive.wired.com/wired/archive/14.06/crowds.html

via the Internet.". The World Bank (2013) also recognizes it as "an Internet-enabled way for businesses or other organizations to raise money in the form of either donations or investments from multiple individuals."

Schwienbacher and Larralde (2010) define *crowdfunding* as "an open call, essentially through the Internet, for the provision of financial resources either in form of donation or in exchange for some form of reward and/or voting rights in order to support initiatives for specific purposes." However, Ethan Mollick (2014) says that such definition leaves some *crowdfunding* models out, as internet-based peer-to-peer lending and fundraising drives initiated by fans of a music group. Mollick develops a broader conceptualization, referring to it as "the efforts by entrepreneurial individuals and groups – cultural, social, and for-profit – to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the internet, without standard financial intermediaries" (2014, p. 2).

Surely, the *crowdfunding* industry is playing a more and more important role as a way of financing, catching the interest of many academic researchers. We performed a search in the Scopus database, the largest abstract and citation database of peer-reviewed scientific literature, by requiring the appearance of the word "*crowdfunding*" in the publication title, abstract, keywords and/or any other field. 318 documents were identified between 2010 and 2014, as showed in Figure 2. It is clear that the number of studies on the topic is increasing at a fast pace since 2010.

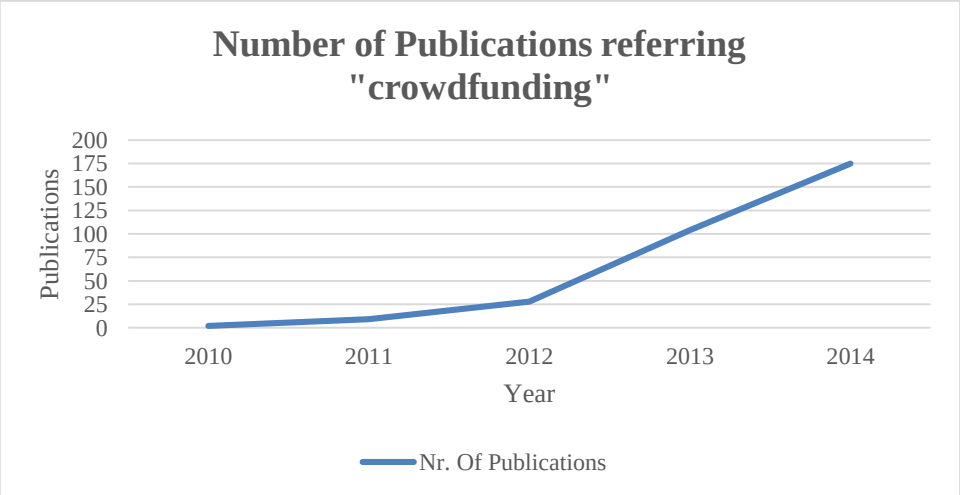

Figure 2 - Evolution of *crowdfunding* research (318 articles).

In fact, considering the issues regarding traditional ways of financing for early-stage businesses, there seems to be evidence of opportunities for *crowdfunding*. Collins and Pierrakis (2012) refer two main opportunities that *crowdfunding* can provide seed capital. First, it corresponds to the initial seed money to start a business, where on one hand friends and family may have insufficient or unavailable funds for financing and on the other hand the amounts required are too small for attracting business angels. Second, there is a gap above the level where business angles are usually active but where the capital required is too small for venture capitalists to get involved. The main differences between *crowdfunding* and the most conventional ways of financing are presented in Table 2.

Table 2 - Traditional financing methods vs. *crowdfunding*. Adapted from Voorbraak (2011)

	Bank loan	**Angel investor**	**Venture capitalist**	***Crowdfunding***
Due diligence	Much	Much	Very much	Limited
Type firm	Low risk	High risk and return	High risk and return	All
Firm size	Early stage firms	Early stage firms	Later stage firms	All
Type investment	Debt	Equity	Equity	Debt, equity, profit or revenue sharing, donation
Intermediated	Yes	No	Yes	No/Yes
Active or Passive	Passive	Relatively active	Very active	Passive/relatively active
Investment horizon	5 years (most common)	5 to 10 years	3 to 7 years	5 to 10 years
Exit	Pay back	Sales or IPO	Preferably IPO	No obligations

It seems consensual that *crowdfunding* has emerged as a viable and scalable alternative to other public and private finance and thus it shall be considered as a way of financing for the first stages of entrepreneurial firm development, as one can see in Figure 3. According to a European Commission report (2014), fundraisers find easiness to access to money, difficulties in raising funding through traditional ways of financing, marketing purposes and promoting their companies as innovative by using *crowdfunding* the main reasons for recurring to this way of financing.

The *crowdfunding* market is expanding at a very fast rate, as shown in Figure 4, reaching a total fundraising of $16.2 billion in 2014 and being expected to grow up to $34.4 in 2015.

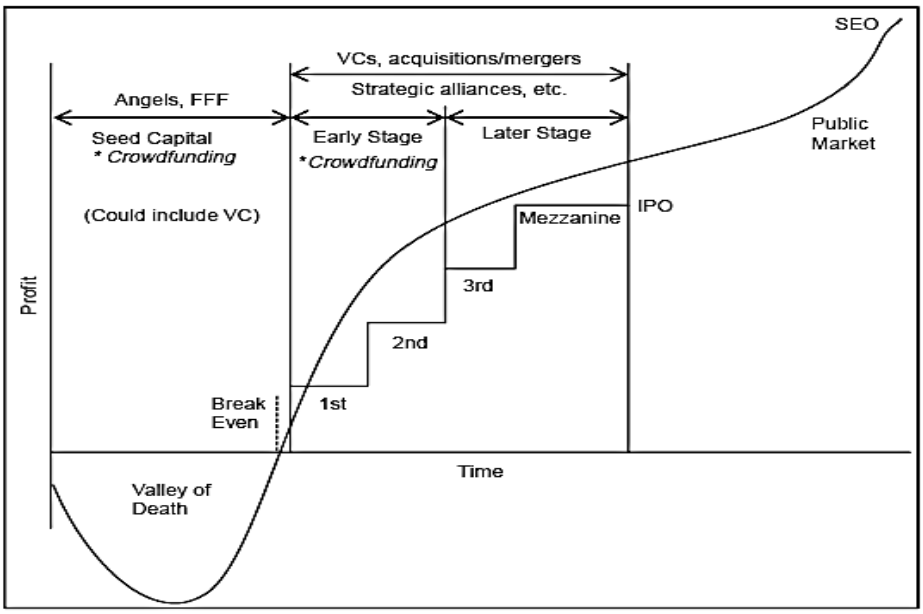

Figure 3 - Stages of entrepreneurial firm development. Taken from D. Cumming and Johan (2009).

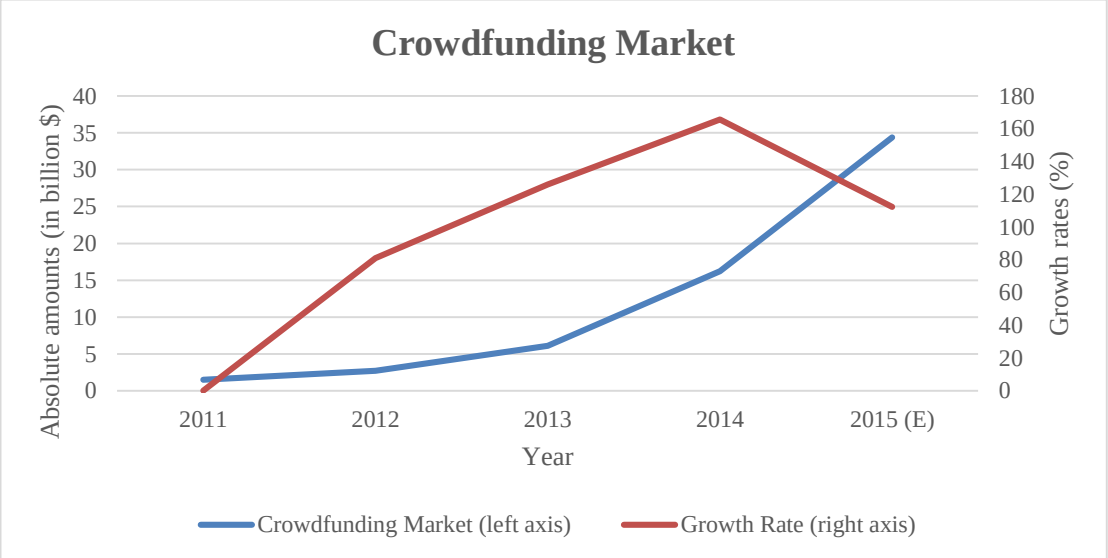

Figure 4 - Evolution of *Crowdfunding* Market. Based on Crowdsourcing.org (2014).

2.3. Parties involved in *crowdfunding*

The *crowdfunding* market involves different agents that interact with each other pursuing their personal interests. The interaction between the different parties involved in *crowdfunding* represents a two-sided market according the definition given by Eisenmann et al. (2006), since the *crowdfunding* market ties together distinct groups of agents in a network, who demand and supply funds.

There may be three parties involved in a *crowdfunding* effort: the fundraisers, the backers and the intermediary. Figure 5 illustrates the possible relations between those agents.

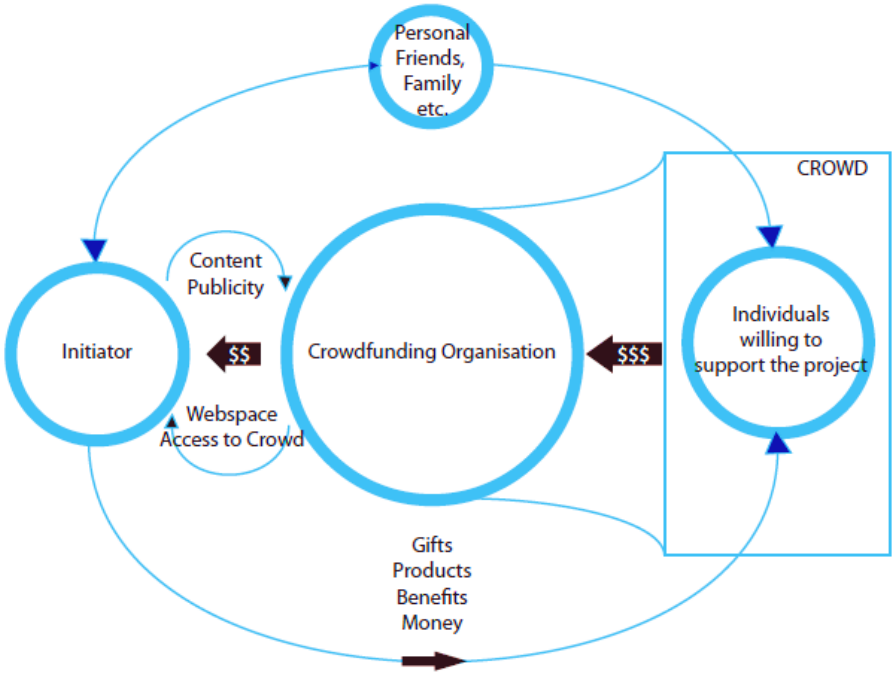

Figure 5 - *Crowdfunding* parties: initiator, crowd and CFP. Taken from Wechsler (2013).

Fundraisers correspond to agents that demand funds through *crowdfunding* to "get direct access to the market and to gather financial support from truly interested supporters" (Ordanini, 2009, p. 5). They want to deliver new initiatives using *crowdfunding* systems, proposing a project, business model or product and they may be musicians, filmmakers, designers, artists, writers, philanthropists, entrepreneurs or anybody with an idea that needs capital for funding it (Wechsler, 2013). Using a *crowdfunding* platform, entrepreneurs promote their projects and exposing their ideas to a wide public, what can

be a very good way to validate their project concept or demand for their products, as well as understanding the scope and characteristics of the target market (Wechsler, 2013).

Backers[4] are those whose role is to "decide to financially support [or not] these projects, bearing risk and expecting a certain payoff" (Ordanini, 2009, p. 5), which can have or not monetary nature. The goals of backers depend on the *crowdfunding* model and on each project specifications. Philanthropists commit their money, to projects such as art or humanitarian causes, without expecting a direct and tangible reward from it, while lenders have expectation of a rate of return on the capital invested. In some *crowdfunding* models backers may receive a reward for financing a project and in others they may act as equity investors, receiving shares in exchange for their money (Mollick, 2014).

A distinction between direct and indirect *crowdfunding* shall be done. Tomczak and Brem (2013) state the first happens when the fundraiser makes a direct appeal to a specific audience, for example through their own platform (usually, a website), and the latter consists in a general appeal for funding to the unknown general public or "crowd", which is commonly executed through an intermediary.

The intermediary corresponds to the company that supplies a CPF through the internet and whose role is to connect fundraisers and backers, working as a matchmaker between them (Burkett, 2011). Platforms simplify and reduce the traditional bureaucracy between funders and founders, allowing funders to look for multiple opportunities in a single virtual place while working an effective promotional tool for founders. There are general purpose platforms, which promote any kind of project, and specialized platforms, which promote projects within a specific theme and thus link better a campaign to its target audience (Calveri and Esposito, 2013). The several types of CFP are analysed in section 2.4.

[4] Backers are also called funders, crowd or investors.

2.4. Types of *crowdfunding* platforms

As an early-stage and high-growth industry, the number of CFP has been increasing in a fast pace over time and new entrants are securing a larger relative percentage of new funds raised (Crowdsourcing.org, 2012). Appendix A illustrates the worldwide distribution of CFP in 2012, showing that the USA and the UK were the countries with the highest number of CFP.

The complexity of transactions can be very different depending on their form (Hemer, 2011), as shown in Appendix B. Donation-based and reward-based models, including sponsoring and pre-ordering, are very straightforward, while lending-based and equity-based models are more complex, raising also more issues for the regulatory authorities.

CFP have significant differences between them, which will be shown after, but according Agrawal et al. (2011) they also share some properties: provide a standardized format for entrepreneurs to present and promote their projects, in a simple and comprehensive way for anyone with internet access; allow financial transactions with broad participation and limited risks; provide investment information. The most common business model of CFP is to have a fee over the money raised by successful campaigns as compensation for its services (Wechsler, 2013).

2.4.1. Donation-base

There are CFP that promote projects and events with a social aim. These platforms follow a donation-based model, in which founders want to obtain funds to help people in need, to take actions for environmental causes or simply to support a specific project that contributes to the potential investors' well-being. *Massolution* (2012) defines donation based *crowdfunding* as a "model where funders donate to causes that they want to support, with no expected compensation".

According Tomczak and Brem (2013), the donation style of investment is associated with the intrinsic motivation of investors, which are not expecting to get a tangible reward in exchange for their funds. Investors assume a philanthropic prosper, as they do not expect monetary compensation for their funds. Donors do not acquire security interest, not

having risk in their "investments", and it is logical that entrepreneurs have more difficulty in raising substantial capital for their projects (World Bank, 2013).

CrowdRise[5] is a "pure" donation-based *crowdfunding* platform, founded by the famous actor Edward Norton and his wife Shauna Robertson, along with Robert Wolfe and Jeffrey Wolfe. It is the world's largest community raising money for charitable projects or events and is located in the US.

In Portugal, there is a platform that exclusively promotes projects with social causes, *Novo Banco Crowdfunding*[6], resultant of a partnership with PPL – Crowdfunding Portugal. Born in January 2013, it has promoted more than 50 social projects to date.

2.4.2. Reward-based

Reward-based *crowdfunding* model is the largest *crowdfunding* model, and together with donation-based, it is the more appropriate for campaigns that appeal to funders' personal beliefs and passions (Moutinho and Leite, 2013).

It includes projects that offer a nonfinancial reward to funders, which is commonly connected to the nature of the project. *Massolution* (2012) refers that the common rewards are a token or, in the case of a manufactured product, a first edition release. Burket (2011) calls them patronage rewards, as they are compensation for investment in the form of gifts or products associated with the fundraiser.

According Wechsler (2013), these type of platforms can be divided into two sub-categories, the "all-or-nothing" model and the "keep what you raise" model. The first one means that if the funding target is not reached within the pre-defined duration of the fundraising, the entrepreneur fails in obtaining funding and the money is returned to backers. It is used as a way to protect funders, as they only commit their money if the entrepreneur gets the total amount of money needed for implementing its project. In the

[5] One can consult the platform using the link: https://www.crowdrise.com/.
[6] One can consult the platform using the link: https://novobanco*crowdfunding*.ppl.pt/pt.

second model, the raised funds are immediately transferred to fundraisers, independently of the success or failure in obtaining the target amount.

The biggest *crowdfunding* platform worldwide is *Kickstarter*[7], an American reward-based platform that uses the "all-or-nothing" model. Since it was founded in 2009, it channelled more than $1.8 billion from over 8.9 million investors and more than 88,300 projects. The Pebble Time smartwatch was the most successful *crowdfunding* campaign of all times, raising more than $20 million from 78,471 backers, followed by the Coolest Cooler travel cooler (Grepper, 2014) that raised over $13 million from 62,642 backers.

In Portugal, the biggest reward-based platform is PPL – Crowdfunding Portugal[8], founded in 2011 as an innovative way of funding creative projects and helping to put them in practice. Since its foundation more than 800 projects have been promoted in the platform, representing more than €1 million raised by fundraisers. 2014 was a remarkable year for the platform, as it has provided more funding than ever before. In that year only, more than €380.000 was pledged to a total of 162 successfully funded projects. The most successful project *3D Antártida*[9], which collected €21,917 from 302 backers in January 2014.

The certification by external entities may enforce confidence and trust in *crowdfunding* platforms, improving relations between agents (Agrawal et al., 2013). In that sense, *Crowdsourcing.org*[10] developed an accreditation programme for *crowdfunding* platforms called *Crowdfunding Accreditation for Platform Standards* (CAPS). PPL is the only Portuguese platform accredited, ensuring the best practices and standards for both fundraisers and investors.

[7] https://www.kickstarter.com/
[8] http://ppl.com.pt/pt.
[9] http://ppl.com.pt/pt/prj/3dantartida
[10] http://www.crowdsourcing.org/

2.4.3. Lending-based

In lending-based *crowdfunding*, also known as peer-to-peer lending, agents lend and borrow money directly to each other, without a traditional financial institution working as intermediary (Wechsler, 2013). As in a bank loan, lenders receive a fixed periodic income and expect the repayment of the original principal investment (Massolution, 2012), but in this case each lender contributes only with a relatively small amount to individual borrowers.

Lenders are able to diversify their investment by lending money to different borrowers, with different profiles, and so mitigate their risk. Before committing their money, they can analyse the information provided by the fundraiser and see if this has a "fair" destination for the money. The *European Crowdfunding Network* states that usually interest rates are defined by the intermediary, in function of fundraisers' default risk and creditworthiness (2014).

LendingClub[11], founded in 2006 and headquartered in the US, defines itself as the world's largest online credit marketplace for both personal and business loans, with lower interest rates than traditional credit institutions resultant of lower operating costs (no branches and operates fully online). It was classified as the 5th American most promising company by Forbes in January 2014, at the time with a revenue of $98 million.

In Portugal, the lending-based CFP are in a very early-stage phase, as is the case of *Mosaic*[12]. It has not until date a relevant number of funded projects.

[11] https://www.lendingclub.com/.
[12] http://blog.mosaic.pt/

2.4.4. Equity-based

Equity-based *crowdfunding* models happen when a fundraiser sells an equity stake in exchange for funders' capital (Tomczak and Brem, 2013) or when compensates them in the form of revenue or profit share agreements (Massolution, 2012). Under this model, funders may gain the right to vote and participate in business decisions.

This *crowdfunding* model has been raising a lot of issues to regulatory authorities around the world. In the USA, there was a lot of discussion during the past few years, where politics and academics analysed the legal framework surrounding it. Despite other potential benefits entrepreneurs may offer, revenue and profit sharing models appeared to be equity-type investment vehicles and thus violated Chapter 5 of the Securities Act, when without registration or compliance with an applicable exemption (Heminway and Hoffman, 2011). The main sources of concern raised were investor protection and investment markets fairness and transparency, the key policies under the Securities Act, as *crowdfunding* may consist in a general solicitation of public saving. A particular issue has to do with a possible irrational herding behaviour from naïve investors, which may fund very unreasonable ideas (Kuppuswamy and Bayus, 2013).

In April 5th of 2012, the President of the USA Barack Obama signed the *Jumpstart Our Business Startups Act* (JOBS act) into law, requiring the Securities Exchange Commission (SEC) to write rules and issue studies on capital formation, disclosure and registration requirements. JOBS act intended to encourage start-ups and small businesses investment, by allowing them to raise capital from investors in a more efficient way, permitting *crowdfunding*, expanding mini-public offerings and creating an IPO on-ramp (SEC, 2012).

JOBS act Title III, which specifically concerns *crowdfunding*, is the one that has not been approved yet. It would allow companies to ask and take investments up to $1 million from non-accredited investors through the Internet, with much less restrictions. However, Titles II and IV already allow private companies to generally solicit offerings to

accredited investors[13], a model that is used for many *crowdfunding* platforms (Silva and Correia, 2013).

Equity-based *crowdfunding* is the most effective model for projects within the software, music and video industries, raising on average the largest amounts of money per campaign (Moutinho and Leite, 2013). A European Commission report (2014) agrees on that, stating that in Europe entrepreneurs raised around €112,998 per equity-based campaign on average, against the average of €12,581 per reward-based campaign. According *Crowdfunder*[14], this model represented 15% of the total *crowdfunding* market in 2014 (Crowdfunder, 2015).

In Portugal, until recently there was not a legal framework regarding equity-based *crowdfunding*, being synthetically understood that any public offering directed to at least 100 non-qualified investors has to comply with the *Portuguese Securities Code* and other regulations by the *Portuguese Securities Market Commission* (CMVM) (Silva and Correia, 2013). For that reason, several Portuguese entrepreneurs recurred to foreign *crowdfunding* platforms for getting funding and finance their projects, among other goals. That is the case of *Agroop*[15], a project offering an online multiplatform that connects farmers to their associations and allows managing their activities in an integrated and informed way, introducing very innovative features[16]. It obtained €75,010 in exchange for 5% equity in the firm, representing an equity valuation of €1,425,000.g

But times for this type of platform are changing, as the Portuguese Parliament approved a legal regime on July 3rd 2015. CMVM is in charge of publishing regulation for monitoring and setting limits for investment per backer and maximum amounts entities

[13] In the USA, accredited investors are the ones with annual income above $200,000 or a net worth more than $1 million, excluding their primary residence.
[14] https://www.crowdfunder.com/
[15] http://www.agroop.net/
[16] For more information, one can take a look at the project's funding campaign, promoted in *Seedrs*: https://www.seedrs.com/post_investment/14649

may obtain. Additionally, under this legal framework investment risks must be very well defined[17].

2.5. *Crowdfunding* and Financial Literature

Some authors have discussed some of the *crowdfunding* features and their relation with the main financial theories. As an innovative way of financing for entrepreneurial projects and early-start businesses, it seems important to present some observations and conclusions regarding that discussion.

First, it is important to notice that *crowdfunding* is considered as a *financial innovation* for early-stage business (Agrawal et al., 2013; Shiller, 2013). For Heffernan *et al.* *financial innovation* means the arrival of a new or better product and/or process that lowers the cost of producing existing financial services (2013). Under this definition, it seems clear that *crowdfunding* may be seen as an important innovation for the financial sector.

Second, one of the greatest debates in financial literature has to do with *market efficiency*. Eugene Fama systemized the theory of *market efficiency* in his studies (Fama and French, 1988; Fama and Malkiel, 1970), especially regarding markets ability to reflect the fundamental or intrinsic value of financial assets in market prices. The author defines an efficient market as the one in which there are no transaction costs in trading securities, all available information is available to all market participants without any cost and all of them agree on the implications of current information for the current price and distributions of future prices of each security (Fama and Malkiel, 1970).

However, according Robert Shiller "efficient markets should be considered a goal, not an established fact" (2014, p. 1507). Shiller refers in that paper that new *crowdfunding* initiatives certainly will cause some "runaway bubbles" and "abuse of ignorant investors", but "if designed and regulated right", they could "create a new way of arousing

[17] http://www.dinheirovivo.pt/faz/negocios/interior.aspx?content_id=4658274&page=1

animal spirits[18] and focusing informed attention onto venture investments" (2014, p. 1510). The author adds that *crowdfunding* may be more effective in funding ideas whose payoff is not fast, whose concept is more difficult to prove and that have other goals beyond profit.

Agrawal et al. (2013) state that *crowdfunding* generates more information than traditional sources of financing for early-stage businesses, as it provides, for example, interest from other investors, ideas for product modifications and extensions from potential users. Thus, the authors say it may increase founders' willingness to pay and lower the cost of capital. Consequently, *crowdfunding* may contribute for the increase of information efficiency, as entrepreneurs can publically promote any kind of information regarding their ideas and projects, and investors can easily and directly access that information. Besides, both agents can effortlessly communicate with each other using CFP features, as comments and questions. But it may also decrease *informational efficiency*, for reasons that will be further discussed.

Crowdfunding fills financing gaps, as we previously referred. Many entrepreneurs with in fact not be able to get funds from potential investors through traditional or other ways of financing. But it is controversial to argue that the crowd is more able to select valuable projects than traditional institutional investors (VC, AF or banks) (Giudici et al., 2012). So stating that *crowdfunding* contributes to *market efficiency* would be a very strong assumption, even more if noting that it is still a very young and recent way of financing.

Third, there are issues related to *asymmetric information*[19] that occur because investors and entrepreneurs have different expectations about venture success and may be difficult for them to communicate them to each other (Voorbraak, 2011). In a *crowdfunding* effort, the fundraiser knows more about the project than the funder, creating uncertainty for the latter (Härkönen, 2014).

[18] Term used by Keynes book "The General Theory of Employment, 1936.
[19] See for example the paper *Corporate financing and investment decisions when firms have information that investors do not have*, by Myers and Majluf, 1984.

Asymmetric information leads to a discussion about the *principal-agent problem*, *signalling*, *moral hazard*[20] and *adverse selection*. According Härkönen (2014), in a *crowdfunding* environment funders are the principals and fundraisers the agents, as the first gives the second the permission to do something for them (implement the project) and thus need to supervise fundraisers' actions. There is a *moral hazard* once the fundraiser has the power to use the money as intents with no significant financial risk of his own. As both parties cannot monitor performance perfectly and contracts are incomplete (Voorbraak, 2011), fundraisers share as much information as they can before, during and after the fundraising campaign in order to get the crowd's trust and lead them to commit their money, that is, they signal. But by doing that, they may be taking the risk of their idea being copied or stolen (Schwienbacher and Larralde, 2010). Finally, there may a problem of *adverse selection* if entrepreneurs recur to *crowdfunding* after justifiably being rejected by other sources of financing (Härkönen, 2014).

So that *asymmetrical information* issues are overcome, external investors use screening as a way to assess small business quality and compliance (usually through due diligence) sign contracts, monitor entrepreneur's performance and execute management control (Voorbraak, 2011). In addition, investors may stage their investments in several rounds, giving them more flexibility and enabling them to wait for the arrival of new information (Schwienbacher and Larralde, 2010).

Some of the informational benefits and risks of *crowdfunding*, relatively to other sources of financing, are presented in Table 3.

[20] See for example the book *The Return of Depression Economics and the Crisis of 2008*, by Paul Krugman, 2009.

Table 3 - Informational benefits and risks of using *crowdfunding*, relatively to traditional ways of financing. Taken from (Voorbraak, 2011)

	Entrepreneur	Investor	Platform
Informational Benefits	Improved knowledge about customer demand	Increased involvement with the company	Improved knowledge about performance of venture
Informational Risks	Decreased competitive advantage due to disclosing ideas on the internet	No control mechanism, only indirect control via social network	Reputation risk

2.6. Similar Studies

In the past few years research on the factors that lead to a successful financing through CFP has been significantly increasing. There are nowadays several studies that use many approaches in studying the phenomena, from very different perspectives, trying to fill gaps in literature and expand knowledge on this recent market. We have seen before many important studies and their conclusions conducted on the theme, which combined provide a wide perspective about the way agents interact and the results of that interaction.

The success or failure in obtaining financing through *crowdfunding* may be caused by infinite factors, as the result comes from an interaction between individuals and/or institutions and is naturally affected by the economic, cultural, political and financial environment. But some factors have definitely more importance than others. Studies usually focus on factors related to the project itself, to specific features and designs of the CFP or to agents' characteristics and motivations. To the best of our knowledge, there is only one study analysing intrinsic CFP features that may impact the rate of successful projects, which was conducted by Willems (2013). Several authors analysed factors derived by investors behaviour, usually conducting interviews and questionnaires (Bretschneider et al., 2014; Harms and Kleihnen, 2007; Kuppuswamy and Bayus, 2013; Moutinho and Leite, 2012; Stiernblad et al., 2013; Wechsler, 2013). But the most important studies for the present dissertation have to do with intrinsic projects' and entrepreneurs' characteristics that may influence the result of a *crowdfunding* effort.

Moutinho and Leite (2012) conducted an empirical study on the critical factors to successfully finance a project, exploring evidence on projects that raised their funding goal through *Kickstarter*. The authors collected their sample retrieving information about 18,430 observations from that platform, consisting exclusively in funded projects between May 3rd of 2009 and February 29th of 2012. Using a linear regression model and applying the ordinary least squares (OLS), they analysed the factors that may contribute to achieve a higher success, within the successful projects. The dependent variable considered was the financing rate[21] (ratio between capital pledged in dollars and goal in dollars), a quantitative variable, and as their sample was exclusively constituted by financed projects, it was always equal or greater than 1. Furthermore, other variables were introduced in their model, such as category, number of backers, number of comments, number of updates, number of levels of reward and number of other projects backed by entrepreneur.

From the quantitative analysis, the authors conclude that categories design, technology, games and art have positive impact in success. The number of backers also evidence a significant positive correlation with success, while the number of levels of rewards have a significant negative correlation (a more complex reward system leads to worse financing results). From the qualitative analysis, it was concluded that success is better achieved when there is a possibility of reaching a large crowd of potential consumers or otherwise to a niche where one can find a passionate and loyal audience. "Tangible" and "interesting" rewards are indicated as having higher probability of success.

Ethan Mollick (2014) also published a study related to the aim of the present dissertation, studying the dynamics of success and failure among crowdfunded ventures. Using a dataset of over 48,500 projects promoted in *Kickstarter*, with a combined funding over $237 million, the author suggests that social capital and preparedness are associated with an increased chance of project success, concluding that quality signals play a role in project outcomes. The degree of a project preparedness was analysed through the variables video (entrepreneurs can add a video), updates (soon after lunching the

[21] In the present dissertation we call it funding rate.

campaign) and spelling errors (in entrepreneurs' pitches). The first two have a positive impact, while the third has a negative signal for project preparedness (and consequently for quality). Additionally, variables duration and goal amount evidenced a significant negative impact in success, while being featured (highlighted in the initial page of by the platform) and network size (number of Facebook friends) showed a positive influence in success. Geography is also a variable analysed and it appears to be linked to the nature and success rates of projects, as according the author proportionally greater creative population is associated with a greater chance of success, controlling for the size of the city, the network of the founder and the number of other *Kickstarter* founders in that city.

Similar studies were thoroughly analysed in order to understand the context and the state-of-the-art regarding *crowdfunding*. Indeed, they consist and construct the foundations of the current study, providing many powerful insights on the theme. Besides, empirical works usually rely on data collected from *Kickstarter*, as it is the main worldwide platform in terms of total amount pledged and number of projects financed. Appendices C and D contain some aspects regarding relevant studies for the present Dissertation.

3. Data Construction and Sample Characteristics

3.1. Data Construction

As the goal of this Dissertation is to provide the widest possible perspective on the determinants of Portuguese *crowdfunding*, we used data from PPL – Crowdfunding Portugal, the biggest and oldest Portuguese *crowdfunding* platform as said before. PPL has conceded information, in exclusive for the present study, about specific characteristics of projects willing to obtain funds from the crowd. The database includes 619 projects promoted in the platform between August 15th 2011 and March 23rd 2015. For each project, it contains information about its identification number, name, category, channel, start and end dates, financing target, raised amount, number of backers, location, number of comments[1], number of images, number of views[2], promoter user name, Facebook link and project URL.

Considering the information expressly given, it was possible to compute supplementary information, such as project duration, funding rate[3], funding per backer[4] and number of promoter previous projects. Additionally, extra information has been retrieved through individual scratch from each project page, specifically the promoter's gender, the number of pledging levels, the highest pledging level[5] and the ratio between this and the target, and finally if a budget document was uploaded, containing at least the destination of the ambitioned funds.

Not every project promoted in the history of the platform is part of the data base, as some projects did not gather sufficient or relevant information. Besides, there are projects that

[1] PPL subscribers have the ability to make comments and questions to the projects' entrepreneurs, for example to dissipate doubts.
[2] Projects may be seen by any individual, subscribed or not in PPL. Projects that succeeded in obtaining funds usually have been seen by a high number of individuals, that is, the number of views.
[3] Ratio between raised amount and target. The goal for each entrepreneur is to obtain at least a ratio of 1, which means raising the minimum amount sought. PPL uses an "all-or-nothing" model, thus the entrepreneurs get funding only if the target amount is reached.
[4] Ratio between raised amount and number of backers.
[5] At this level, the entrepreneurs supposedly offer the best reward.

had not reached their *crowdfunding* delivery date on the March 23rd of 2015, thus they were excluded from the sample.

With the sample defined, a statistical and econometrical analysis is conducted in order to determine the most relevant factors for obtaining financing through *crowdfunding*.

3.2. Sample Characteristics

A few observations were removed from the sample, specifically the projects that had not reached their end dates, which had incomplete information or whose duration was zero. We were left with a total number of 613 observations in our sample, as shown in Table 4, corresponding to an aggregated target amount of €1,788,370. 290 projects were successfully funded, representing 47.2% of the total projects considered, raising an aggregated amount of €740,868. With an opposite result, 323 projects failed in obtaining financing through PPL, which intended aggregately to gather €1,140,160.

Table 4 - Target and raised amounts, by successful and failed projects

	Nr. of Projects	%	Target	%	Raised	%	Funding Rate
Successful	290	47.3	648,210	36,2	740.868	85.0	1.14
Failure	323	52.7	1,140,160	63,8	130.430	15.0	0.11
Total	613	100.0	1,788,370	100,0	871.298	100.0	0.49

There were 24,932 individuals that committed their money into the projects promoted in the platform, with an average number of 41 backers per project and an average funding of €37 per backer. Considering only the successful projects, 19,121 backers invested a total of €740,868, which means an average of 66 backers per successful project and an average funding of €57 per backer. It is also important to notice that €130,450 have not been placed, as the projects failed in obtaining the funding target and thus the money was returned to the respective 5,811 investors.

According Figure 6, funding rate shows a mean of near 0.60, which is lower than the value that would secure a successful fundraising, of 1. It means that on average entrepreneurs fail in raising the total amounts of funding they need. However, there are cases that highly exceed the amounts looked for. The maximum value observed for FR is

3.15, meaning that the entrepreneur obtained in this case more than 3 times the target amount.

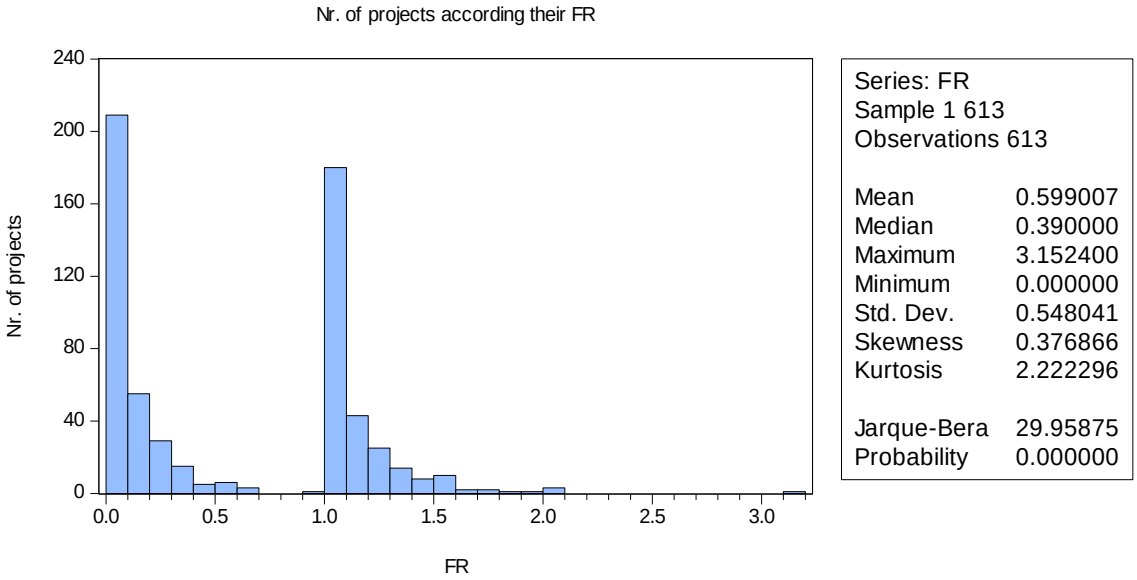

Figure 6 - Histogram of funding rate, using EViews 8.

Projects are clustered in different categories, as seen in Figure 7. Categories with a number of projects under 10 were included in "Others", remaining the categories Agro-Industry/Food, Art, Community, Dance/Cinema/Theatre, Education, Entrepreneurship, Environment, Events, Fashion/Design, Music, Others, Publishing, Sports, Technology, Tourism and Video/Photography. The categories with the highest number of projects promoted are Music (108), Publishing (96) and Entrepreneurship (58), while Art (11), Fashion/Design (13), Environment (14) and Tourism (14) have the least number. However, if looking at the ratio of successful projects over total number of projects, we see that Fashion/Design (69%) and Environment (64%) have the higher percentage of successful projects, while Agro-Industry/Food (12%) and Tourism (29%) have the lower percentages.

In the platform, certain projects may be highlighted through PPL channels, precisely regarding the publishing of books written in Portuguese (channel *Livros de Ontem*), social causes (channel PPL *Causas*) as volunteering actions and humanitarian intervention or acquiring equipment for social institutions, college students entrepreneurship (channel BET24), scientific investigation to prevent, diagnose and provide better treatments for diseases without a definite cure (channel *Maratona da Saúde*), a solidary challenge

promoted by Oikos (channel *Oikos Desafio 100*) and entrepreneurial ideas presented in a Portuguese television show (channel The Next Big Idea). The sample includes 72 projects highlighted in a specific channel, of which 35 succeeded in obtaining financing.

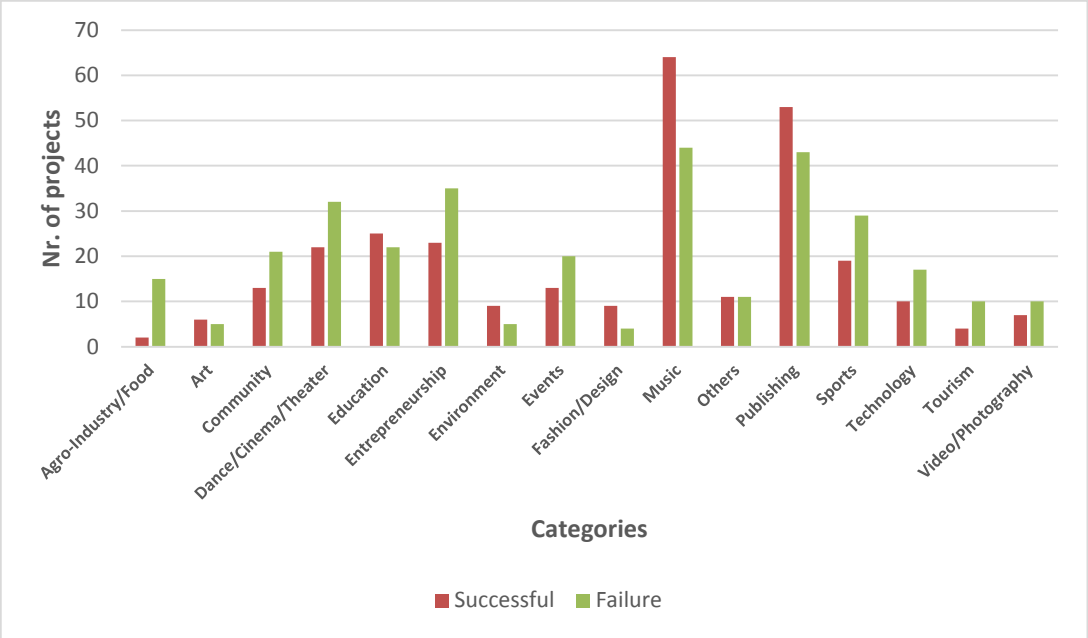

Figure 7 - Number of successful and failure projects by category.

Entrepreneurs have the option to include images in order to capture the interest of the backers and complement the information specified in the platform page and video. A total of 3,263 images were uploaded by promoters. Furthermore, the number of views and comments may signal the interest of potential backers in the *crowdfunding* projects during a campaign. Projects may be seen by any individual, subscribed or not in PPL. The total number of views reached more than 2,304,155, again with more emphasis in the successful projects that gather 68% of total views. Potential funders have the ability to make comments and questions to the projects' entrepreneurs, for example in order to dissipate doubts. There were a total of 1,065 comments, of which 69% regarded projects that succeeded in obtaining financing.

Most of the projects from the sample are located in Portugal, specifically 570 projects that raised a total amount of €819,082. Lisbon and Porto, the most populated counties in Portugal, were the origin of 255 and 91 projects respectively, representing together 56%

of the total projects and a total raised amount of €527,732. In Lisbon, 141 (55.3%) projects obtained financing, while 114 (44.7%) failed in their intent.

Ex-post information has also been collected and may also be important to understand the characteristics of the projects promoted in PPL. On average, each project from the sample raised €1,421.40, with a median of €670 and a standard deviation of €2,752.73, and was backed by 40.67 investors. The funding per backer ratio, which concerns only the projects with at least 1 backer (586 projects), is on average of €38.50 and has a median of €26.09. Finally, the number of comments and views signals projects that called more the attention of potential backers, as they evidence a higher activity in the projects' pages. Each project has on average 1.74 comments and 3,758.82 views.

4. Methodological Aspects

The core goal of the study is to understand the factors that lead to a higher probability of success or failure in a Portuguese *crowdfunding* platform, thus it is important to understand what we mean with "success" and "failure". PPL uses an "all-or-nothing" model, as previously explained, and so only projects that raise exactly the target amount or more succeed in obtaining financing, that is, that have a funding rate equal or higher than 1. In the same sense, only projects whose raised amount does not reach the predefined target are considered unsuccessful, as they failed in obtaining the funds intended, that is, they have a funding rate lower than 1.

Models for mutually exclusive binary outcomes, as it is our case, focus on the determinants of the probability p of the occurrence of one outcome rather than an alternative one, with probability $1 - p$ (Cameron and Trivedi, 2009). We could use the linear probability model (LPM), fitted by OLS, but the errors (i.e., the estimation residuals) violate the homoscedasticity and normality errors assumptions of OLS regression, resulting in invalid standard errors and hypothesis tests (Brooks, 2014; Long, 1997; Wooldridge, 2009).

We decided then to use probit and logistic[1] models, as they are the two most standard binary outcome models (Cameron and Trivedi, 2009), and the maximum likelihood estimator (ML). These models are able to overcome some of the limitations of LPM, as the production of estimated probabilities that are negative or greater than one (Brooks, 2014).The main difference between the two is related to the distribution of the errors, as the probit assumes a normal distribution and logit a standard logistic distribution.

The coefficients of the explanatory variables cannot be interpreted as in a linear regression model. According Long (2014, p. 234) the interpretation of the coefficients, in this case called "odds ratio", has non-linearity issues. Nonetheless, in our study it has more importance to see if they are *ceteris paribus* statistically significant, as well as if they

[1] Usually, it is referred as logit, as it is going to be called hereafter.

have a positive or negative impact in the dependent variable, for a certain significance level, and not the magnitude of that impact.

Lastly, the econometrical software EViews 8 allowed us to conduct our estimations through the method of Huber/White robust covariances, insuring that the standard error estimates are robust to heteroscedasticity (Brooks, 2014, p. 585).

4.1. Regression model

There are several factors that may influence the success or failure in obtaining financing through *crowdfunding*. In one hand, there are intrinsic project features and characteristics evidenced by the entrepreneur that may arouse or not the interest of investors. In the other hand, investors may have themselves behavioural patterns that lead them to invest or not in a certain project. The present study will only focus on the first, as the data contains information on the projects and respective entrepreneurs, and not on the investors.

It is also important to notice that some of the information is defined by the entrepreneur before the start date, while other can only be obtained after the end date. The ex-ante information includes some intrinsic project features and entrepreneurs' characteristics. The number of backers, comments and views consist in ex-post information. We decided to focus our analysis in the ex-ante determinants, in order to determine the probability of success at a project start date. Ex-post information could have endogeneity issues.

The success probability model has a binary dependent variable (**s**), which assumes the value 0 if it is a project that failed in obtaining financing and 1 if it is a project that succeeded in its *crowdfunding* effort. Project characteristics ($\boldsymbol{v}$), additional information and feature ($\boldsymbol{w}$), location ($\boldsymbol{x}$) and entrepreneur characteristics ($\boldsymbol{z}$) are used as independent variables to explain success:

$$s_i = c + v_i\beta_1 + w_i\beta_2 + x_i\beta_3 + z_i\beta_4 \quad (1)$$

The $\boldsymbol{v}$ variables include project duration (DN), the number of images (IMG), the logarithm of project target (TG), the ratio highest pledging level over project target (HPT) and the number of pledging levels (NPL). Previous work[2] suggests all of these variables have a negative relation with the likelihood of success, except IMG, which is expected to be a way to call for funders' attention. The $\boldsymbol{w}$ variables comprise Facebook link and budget[3], which consist in ways of providing additional information, and channel, as there are projects featured in other pages with the intent of being highlighted.

The $\boldsymbol{x}$ variables contain a county dummy, which intends to see if projects from Lisboa have different probability of succeeding than the rest, and a country dummy, as a way to see if Portuguese projects have higher chance of success. Finally the $\boldsymbol{z}$ variables include entrepreneur's experience, assuming that an entrepreneur that has already promoted one or more projects in the past has "experience", and an institutional dummy, which analyses if the fact of a project being promoted by an institution has more chance of getting funding. In addition, an entrepreneur's gender dummy is introduced.

Dummies variables that control for category fixed effects, year fixed effects and month fixed effects are also included. All the variables used are explained in more detail next.

4.1.1. Variables

The following quantitative and qualitative variables are analysed:

1) **Success**: binary dependent variable, which assumes value 1 when project succeeds in obtaining financing and 0 otherwise. The goal for each entrepreneur is to obtain at least a funding rate of 1, which means raising the minimum amount sought and thus success. PPL uses an "all-or-nothing" model, so the entrepreneurs get funding only if the target amount is reached. If not, the funds raised go back to funders and the project fails in obtaining financing.

[2] Moutinho and Leite (2012); Mollick (2014).
[3] Entrepreneurs can upload files containing additional information, such as a budget, but they can also specify in the project's webpage where they intend to spend or invest the funds collected. In both situations, it is assumed that entrepreneurs included a budget.

2) **Duration**: the number of days since the project is available in the *crowdfunding* platform for potential investment and until the funding delivery date, that is, the last day for which a project accepts funding. Nowadays PPL advises that promoters choose between 20 and 60 days, referring that "longer deadlines do not necessarily mean higher funding probabilities" (PPL, 2015). However more than 100 projects had a duration outside that range.
3) **Number of images**: before the financing start date, entrepreneurs have the option to upload images that may increase the power to attract more funders.
4) **Project target**: minimum amount fundraisers seek to obtain for their projects. If the amount raised reaches the target, it is considered a successful fundraising; otherwise, project failed in obtaining funds.
5) **Number of pledging levels**: number of funding levels that a funder has at its disposition to choose, according the respective reward. Entrepreneurs shall offer a perceived better reward for a higher level of reward, in order to incentive funders to commit their money.
6) **Ratio highest pledging level over project target**: a high ratio means that a short number of backers may fund the biggest or the whole part of the target amount, thus the respective reward must be very appealing. If not, an unrealistic high level may induce investors not to commit their money to the project.
7) **Facebook link:** entrepreneurs may create an account on Facebook, where they can spread out the word about their projects, and add the link to the projects' *crowdfunding* page. It is a dummy variable that assumes value 1 for projects that are promoted in parallel through Facebook and 0 otherwise.
8) **Budget:** a budget may be important for funders to analyse the pertinence of the project and the reasons for the fundraising itself and seems to contribute, *a priori*, to the transparency of the fundraising efforts. The respective dummy assumes value 1 if the project included a budget and 0 if not.
9) **Channel**: PPL has specific places, named "channels", where particular projects may be highlighted for specific reasons or purposes. Being promoted in a channel should increase the probability of a project successful financing. It is a dummy variable, with projects featured assuming value 1 and the rest value 0.

10) **County/Country**: despite PPL being headquartered in Lisbon, Portugal, the platform accepts to promote projects from anywhere in the world. Thus, there are projects from several countries, as well as from any of the 18 Portuguese counties or autonomous regions (Madeira and Açores). Using the specific location of a project, we computed the respective county and country. For the ones that did not have any specific location or that had more than one, we assumed the promoter's location. These are also dummy variables, which assume value 1 if they are from Lisboa or Portugal, respectively, and 0 otherwise.
11) **Entrepreneur experience**: the previous experience of an entrepreneur or promoter may signal a higher probability of being succeeded in obtaining financing through *crowdfunding*. For analysing the experience, we have checked for the entrepreneurs that had promoted more than 1 project in PPL through times and the intent is to see if having at least one past promoted project affects the probability of succeeding in obtaining financing. That was analysed by introducing a dummy, which assumes value 1 if entrepreneur has experience and 0 if not.
12) **Institution**: projects can be promoted by individuals or institutions, as cultural or sport institutions. This dummy variable undertakes value 1 for projects promoted by institutions and 0 otherwise.
13) **Promoter gender**: projects may be promoted by one or more individuals. For this variable, only the projects promoted by a single individual were considered, being divided in "male" or "female". This dummy variable assumes value 1 for projects promoted by male and 0 by female entrepreneurs.
14) **Category**: PPL categorizes projects according their goal or project characteristics. The projects belonging to original categories that included less than 10 projects were re-grouped in the category "Others", leading to a final number of 16 categories: Agro-Industry/Food, Art, Community, Dance/Cinema/Theatre, Education, Entrepreneurship, Environment, Events, Fashion/Design, Music, Others, Publishing, Sports, Technology, Tourism and Video/Photography. Each category has particularities that may influence the other variables used, thus dummies were added to control for those effects.

15) **Year/Month**: as the *crowdfunding* market is very recent and is rapidly growing, it seems important to introduce the effect that a year at which it was promoted may have in success. For projects promoted in more than one year[4] it is assumed the latter one. Additionally, there may be seasonal effects, thus we introduced dummies to control for month effects.

[4] For example, a project can start in December of 2014 and end in January of 2015. In this case, it is assumed that 2015 is the project's year.

5. Results

5.1. Summary Statistics

Table 5 reports summary information about the 613 projects included in the database. Each project has on average 54.71 days, with a standard deviation of 20.41, being within the duration range proposed by PPL. Entrepreneurs upload on average 5.32 images, so that their projects are more appealing for investors, with a median number of 5 images per project.

Table 5 - Summary Statistics for quantitative variables

Quantitative Variables	Mean	Median	Max	Min	Std. Deviation	N
Duration (days)	54.71	58.00	132.00	10.00	20.41	613
Nr. Of Images	5.32	5.00	10.00	0.00	3.06	613
Target (€)	2,917.41	2,000.00	166,000.00	500.00	8,012.83	613
Nr. Of Levels of Reward	5.60	6.00	11.00	1.00	1.65	613
Highest Pledging Level / Target	0.13	0.07	1.67	0.00	0.18	613

Projects have on average the ambition to collect €2,917.41 from investors, with a median of €2,000. Target amounts vary significantly, with a standard deviation of €8,012.83, being in a very wide range, €500 - €166,000. Entrepreneurs have also the option to choose the variety of pledging levels, according the rewards offered in exchange. On average, entrepreneurs provide 5.6 different rewards for inducing investors to commit their money. Looking at the highest pledging level defined by the entrepreneurs, one can state that on average it corresponds to 13% of the target amount, but there are projects whose highest pledging level is higher than the target, meaning that one investor willing to commit funds in this pledging level would be enough for the successful fundraising of the projects.

Table 6 presents the correlations between the quantitative variables of the study. The variables highest pledging level over target and the number of levels of reward are the variables with the highest positive correlation, of 0.42, at a significance level of 1%. The latter variable also evidences positive correlations with the variables number of images, target and success (0.14, 0.12 and 0.10 respectively). Entrepreneur experience seems to

have a positive correlation with success, while the target amount has the highest negative correlation with that variable (-0.08).

Table 6 – Correlations between quantitative variables

	Success	Duration	Nr. Images	Target	Nr. of Levels of Reward	Highest Level over Target	Entrepreneur Experience
Duration	-0.01						
Nr. Images	0.02	0.05					
Target	-0.08**	0.05	-0.02				
Nr. Levels of Reward	0.10**	0.06	0.14***	0.12***			
Highest Pledging Level over Target	0.02	-0.10***	0.05	0.00	0.42***		
Entrepreneur Experience	0.12***	-0.05	0.03	-0.02	0.04	-0.04	

*, ** and *** indicate that the correlations are statistically significant at the significance levels of 10%, 5% and 1% respectively.

5.2. Econometric results

Logit and probit models usually produce similar characterisations of the data, as their densities are very similar (Brooks, 2014). In fact, looking at the estimation outputs of logit and probit models, presented in Table 7 and Annex E respectively, one can state that they are very similar in terms of variables significance and impact (positive or negative) in success. Thus, and as in terms of predictions there are no reasons to prefer one of them (Long and Freese, 2014, p. 209) we focused on logit model by personal choice.

Table 7 shows the results for the binary model, including seven different equations with different kind of variables. Category, year and month fixed effects are included in each model.

In the first model, in which we analysed intrinsic project characteristics, there are two variables that are likely important for success. On one hand, the log of the target is a significant variable for a significance level of 1%, maintaining the rest constant, and it seems to have a negative impact in success. It is an expected result since it has been pointed out that *crowdfunding* is directed to small businesses or projects, in an early-stage phase. On the other hand, the number of levels of reward seems to have a positive impact in success, for a significance level of 1%, *ceteris paribus*. This result is the opposite than

what Moutinho and Leite (2013) found for *Kickstarter* projects, but it seems to agree with that platform recommendations: "Every backer counts, so be sure to offer an array of rewards that can appeal to all different kinds of people"[1]. We shall remember that *Kickstarter* is the most successful CFP in the world.

Model 2 considers variables about additional information provided by the promoters, as well as a variable on the effect of highlighting a project in a PPL channel. The promotion on Facebook, the inclusion of a budget and being featured in a channel should improve the probability of success, but that conclusion is not supported by our sample as it seems that none of these variables have statistical significance, *ceteris paribus*.

The impact of project location for success was examined in Model 3. Variable "county" showed a significant positive impact for success, everything else constant and for a significance level of 1%, meaning that projects that are from the Portuguese capital Lisboa seem to have a higher probability of succeeding. With a different result, variable "country" does not have impact in success, what means that there seems to be no difference between the probability of success for projects located in Portugal or abroad. This is quite important as *crowdfunding* is being pointed out as a way to overcome that constrain and mitigate the distance effects found in traditional fundraising efforts (Agrawal et al., 2011).

Models 4 and 5 examine entrepreneur's characteristics. Starting by introducing in exclusive the variables institution and entrepreneur experience, in Model 4, it seems likely the latter to have a positive impact in success, for a significance level of 1%. It makes sense, as promoters learn with experience[2] and acknowledge the difficulties and opportunities of promoting a *crowdfunding* campaign. Oppositely, projects promoted by an institution, rather than an individual or group of individuals, seems not to have a higher chance of succeeding in their fundraising effort.

[1] https://www.kickstarter.com/help/handbook/rewards.
[2] Note that the concept of "experience" has in this case a strong implicit simplication, as we consider that experienced entrepreneurs are the ones that promoted at least one campaign before in PPL.

Table 7 - Logit estimation outputs

Success (S_1)	**LOGIT**						
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
DN	0.00					0.01	0.01
	(0.00)					(0.00)	(0.01)
IMG	0.02					0.02	0.00
	(0.03)					(0.03)	(0.04)
Log (TG)	-0.52***					-0.58***	-0.76***
	(0.13)					(0.13)	(0.19)
HPT	-0.92					-0.93	-2.62***
	(0.68)					(0.73)	(0.99)
NLR	0.20***					0.20***	0.28***
	(0.07)					(0.07)	(0.09)
Facebook Link		0.32				0.29	0.65**
		(0.22)				(0.22)	(0.29)
Budget		-0.05				0.02	-0.07
		(0.18)				(0.19)	(0.24)
Channel		0.40				0.03	0.62
		(0.30)				(0.35)	(0.46)
County			0.53***			0.66***	1.11***
			(0.18)			(0.20)	(0.28)
Country			-0.43			-0.51	-1.00**
			(0.35)			(0.37)	(0.49)
Institution				0.18		0.10	
				(0.19)		(0.21)	
Experience				1.27***	0.11	1.03**	0.26
				(0.46)	(0.67)	(0.51)	(0.69)
Gender					-0.44*		-0.30
					(0.23)		(0.25)
Category Fixed Effects	Included	Included	Included	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included	Included	Included	Included
Month Fixed Effects	Included	Included	Included	Included	Included	Included	Included
constant	0.93	-2.06**	-1.94*	-1.97**	-1.82*	1.33	2.97
	(1.39)	(0.95)	(1.03)	(0.97)	(1.07)	(1.45)	(1.94)
Obs	613	613	613	613	392	613	392
LR statistic	64.58***	47.47**	51.91***	53.24***	37.62	85.15***	78.75***
McFadden R^2	0.08	0.06	0.06	0.06	0.07	0.10	0.15

*, ** and *** indicate that the correlations are statistically significant at the significance levels of 10%, 5% and 1% respectively.

Model 5, in which the variables entrepreneurs' experience and gender are inserted, is applied to a sub-sample, as previously explained, of 392 observations. In this Model projects that were promoted by institutions were left out, as well as projects promoted by several entrepreneurs from opposite genders. We were left out with only projects that were promoted by a single entrepreneur or several entrepreneurs of the same gender. In this case, gender seems to be a relevant factor for determining success, as it is statistically significant for a significance level of 10%. This result means that female entrepreneurs seem to have higher chance of succeeding.

The whole sets of explanatory variables are combined in Models 6 and 7, whose main difference is the exclusion of variables institution and gender respectively, and consequently the number of observations. Most of the previous conclusions are confirmed, as the variables target, number of levels of reward and county are statistically relevant for a significance level of 1%. The effects of those variables in success maintain their signal.

However, these models have different results regarding other variables. In Model 6, entrepreneur's experience is also statistically significant, but for a higher significance level (5%). In Model 7 more variables appear to be significant, specifically the highest pledging level over target (with negative influence, for a significance level of 1%), Facebook link (with positive influence, for a significance level of 5%) and country (with negative influence, for a significance level of 5%). Additionally, variable gender has no longer a statistically significance in this model.

It is also important to notice that McFadden R^2 increased in Models 6 and 7, what seems to be a good indication that the model fit has improved (Brooks, 2014, p. 568). However, the author adds McFadden's R^2 does not have an intuitive interpretation by itself.

6. Conclusion

Crowdfunding has appeared as a new way of fundraising, mainly for early-stage businesses and projects, overcoming many of specific issues of the traditional ways of financing. Banks limited their credit offerings and increased their requirements, AF does not fulfil all the financing needs of projects in an embryonic state and VC usually does not look for smaller investments.

Many entrepreneurs started looking for capital elsewhere and found in *crowdfunding* a way to access funds from the crowd. Statistics referred in this study support that idea, since the market has been growing exponentially since its beginning. In fact, it is expected to more than double, again, in 2015. If looking at the number of *crowdfunding* platforms by type, reward-based models are the most common worldwide.

As a financial innovation, *crowdfunding* may be contributing to the financial markets efficiency, supplying features that were not able to founders and funders before. It seems to connect them, in a simple and easy way, allowing the possibility of financing creative projects that may lead to the creation of value for the society. Entrepreneurs can promote their projects' specificities and their visions towards the future of the project; funders can access investment opportunities and interact, through comments and questions, with entrepreneurs. But some important risks shall be considered, particularly regarding *information asymmetry*, *principal-agent problem*, *moral hazard* and *adverse selection*.

Our empirical analysis was based on a sample of projects promoted in PPL between August 2011 and March 2015. After excluding some of the observations, which did not gather enough information and whose campaign was still "alive", we ended up with a total of 613 projects. Of those, 290 (47.3%) had a successful fundraising and 324 (52,7%) failed in their intent. It evidences that *crowdfunding* may be an alternative for early-stage businesses to collect capital, but still most of the projects fail in obtaining financing, in agreement with other studies. Thus, funders commit their money to projects that are more appealing and that signal more quality. This result contests the statement that entrepreneurship may be *the solution* to overcome the recent financial crisis, as we can state that most of the projects cannot gather enough capital to finance their embryonic

activities, either in *crowdfunding* either in the traditional ways of financing entrepreneurism.

In our study, we analysed the projects' and entrepreneurs' intrinsic characteristics that may signal a higher probability of succeeding. Using models with a binary dependent variable we found that *ceteris* paribus the higher the target amount defined by the entrepreneur, the lower the chance of succeeding, and also that a higher number of levels of reward and entrepreneur's experience have positive impact in successful fundraising in Portugal. Additionally, projects from Lisboa seem to have a higher chance of succeeding.

Using a sub-sample, considering only the projects for which it was possible to know the gender of the entrepreneur, we found out that gender is not a determinant factor to obtain financing through *crowdfunding* in Portugal. Additionally, the models applied to this sub-sample showed that the variables highest pledging level over target and country may have negative influence in the outcome of the *crowdfunding* effort, while having an active Facebook account may positively contribute for a successful fundraising.

7. Limitations and suggestions

The level of financial literacy in Portugal may raise some doubts about the ability and awareness of investors to commit their funds to *crowdfunding* projects, as well as the preparedness and quality of projects promoted by the entrepreneurs. This is also connected to the concerns about the delay in the regulation of this market in Portugal compared to other developed countries.

Our intent was to study the factors that have positive and negative impact in Portuguese *crowdfunding* efforts. Despite PPL being the biggest Portuguese CFP in number of projects and amounts aggregately raised, our sample is composed by projects promoted in a single CFP. Thus, the results may be affected by characteristics inherent to the CFP and may not exactly represent the whole Portuguese *crowdfunding* market. In this matter, it would be interesting to analyse projects promoted in more CFP, as well as with different business models.

Furthermore, researchers have studied for other CFP additional factors that may influence the output of a *crowdfunding* effort, particularly misspellings (in a project description or video), video quality, number of Facebook "likes", number of Facebook friends of entrepreneur or entrepreneur's antiquity in the platform. Possibly more information could be computed or obtained regarding projects' or entrepreneurs' characteristics, what could provide additional insights on our study.

Finally, the present study only analyses *a priori* characteristics of projects and entrepreneurs that may lead to a higher chance of success, with no intention to investigate the reasons behind investors' decisions and bias they may have. This is a natural topic for further empirical research about the Portuguese *crowdfunding*.

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Appendix A – Worldwide distribution of CFP in 2012

Figure 8 - Number of CFP in 2012. Taken from Crowdsourcing.org (2012).

Appendix B – Major forms of capital provision and their complexity

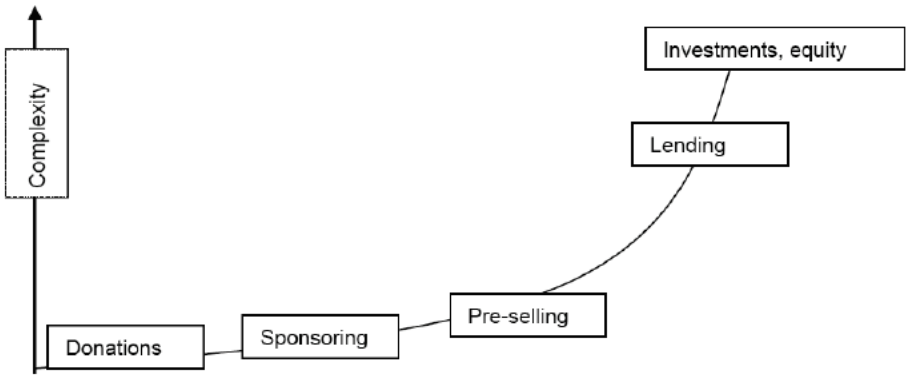

Figure 9 - Major forms of capital provision ranked by process complexity. Taken from Hemer (2011).

Appendix C – Determinants of successful and unsuccessful fundraising analysed by other authors

Table 8 - Sum up of some of the most relevant studies for analysing the determinants of success and failure in obtaining financing

Type of Financing	Result	Determinants	Studies
Crowdfunding	**Successful**	Nr. of Backers; Category; Nr. of Comments; Entrepreneur Backed; Levels of Reward	Nuno Moutinho and Pedro Leite (2012)
		Geography	Agrawal et al. (2011)
	Successful and Unsuccessful	Type of Organization	Lambert et al. (2010)
		Funding Cycle	Ordanini et al. (2009); Moutinho and Nogueira (2014)
		Project Goal; Funding Level; Nr of Backers; Pledge/Nr of Backers; Facebook Friends of Founders; Category; Nr of Updates; Comments; Duration; Geography	Ethan Mollick (2013)
		Gender	Marom et al. (2014)
Venture Capital	**Successful**	Prior entrepreneurial experience; Tenacity; Customer Service	Sorensen and Chang (2006)
			Hussain and Yaqub (2010)
Business Angels	**Successful**	Due diligence prior to investment; Social capital and networks	OECD (2011)
	Successful and Unsuccessful	Perceived risk of the market; Industry experience	Thurik et al (2005)

Appendix D - Methodological considerations on similar studies

Table 9 - Empirical studies and some methodological considerations

Authors	Source	Sample Size	Data Collection	Financing	Statistical Analysis
Nuno Moutinho and Pedro Leite (2012)	Kickstarter	18,430	Software	Successful	Regression
Nuno Moutinho and Rui Nogueira (2014)	Kickstarter	7,398	Software	Successful and Unsuccessful	Regression (Probit Model)
Agrawal et al. (2011)	Sellaband	4,712	Unknown	Successful	Discrete choice model
Ethan Mollick (2014)	Kickstarter	48,526	Unknown	Successful and Unsuccessful	Regression
Marom et al. (2014)	Kickstarter	25,073	Software	Successful, Unsuccessful and ongoing	Regression
OECD (2011)	Business Angels	N.A.	Surveys	Successful	No usage of Econometrics
Hussain and Yaqub (2010)	Micro-enterprises	26	Surveys	Successful and Unsuccessful	Multiple case study method
Thurik et al (2005)	Start-ups	517	Database + Surveys	Successful and Unsuccessful	Logistic Regression

Appendix E – Probit estimation output

Table 10 - Probit estimation outputs

Success (S_1)	**PROBIT**						
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
DN	0.00					0.00	0.00
	(0.00)					(0.00)	(0.00)
IMG	0.01					0.01	0.00
	(0.02)					(0.02)	(0.02)
Log (TG)	-0.32***					-0.35***	-0.46***
	(0.08)					(0.08)	(0.11)
HPT	-0.54					-0.54	-1.58***
	(0.39)					(0.41)	(0.57)
NLR	0.12***					0.12***	0.17***
	(0.04)					(0.04)	(0.06)
Facebook Link		0.19				0.18	0.38**
		(0.13)				(0.13)	(0.17)
Budget		-0.03				0.01	-0.03
		(0.11)				(0.12)	(0.15)
Channel		0.25				0.01	0.37
		(0.19)				(0.21)	(0.28)
County			0.33***			0.40***	0.67***
			(0.11)			(0.12)	(0.16)
Country			-0.27			-0.31	-0.60**
			(0.22)			(0.23)	(0.29)
Institution				0.11		0.06	
				(0.12)		(0.13)	
Experience				0.78***	0.07	0.63**	0.15
				(0.27)	(0.42)	(0.30)	(0.43)
Gender					-0.27*		-0.19
					(0.14)		(0.15)
Category Fixed Effects	Included	Included	Included	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included	Included	Included	Included
Month Fixed Effects	Included	Included	Included	Included	Included	Included	Included
constant	0.58	-1.22**	-1.14*	-1.16**	-1.10*	0.82	1.74
	(0.82)	(0.54)	(0.59)	(0.55)	(0.61)	(0.85)	(1.13)
Obs	613	613	613	613	392	613	392
LR statistic	64.90***	47.42**	51.97***	53.30***	37.76	85.29***	78.84***
McFadden R^2	0.08	0.06	0.06	0.06	0.07	0.10	0.15

*, ** and *** indicate that the correlations are statistically significant at the significance levels of 10%, 5% and 1% respectively.